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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/041,786	01/07/2002	Hardayal Singh Gill	IBM1P006/SJ0920010087US1	3113

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EXAMINER

KLIMOWICZ, WILLIAM JOSEPH

ART UNIT	PAPER NUMBER
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2652

DATE MAILED: 10/10/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/041,786

Applicant(s)

GILL ET AL.

Examiner

William J. Klimowicz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizoshita et al. (US 5,583,726) in view of Hines et al. (WO 1/41214 A1).

As per claims 1, 16, 17, 18, 19 and 20, Mizoshita et al. (US 5,583,726) discloses a magnetoresistance (MR) magnetic head and method for manufacturing such head (e.g., FIGS. 4-6, or 1(a), 1(b), etc.), comprising: a first shield (33) and a second shield (28) defining a gap (at (51)) between poles (33) and (28) at air bearing surface - (see Fig. 5) adapted for being positioned over a magnetic recording disk; and a MR sensor (26) positioned between the first shield (33) and the second shield (28); wherein a plane in which the MR sensor is positioned is

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perpendicular to magnetic flux associated with the magnetic recording disk (disk would be positioned vertically, if depicted, in Fig. 5, in a manner known by those of ordinary skill).

As per claims 5 and 20, further comprising a first insulator layer (lower half (101)) positioned between the first shield (33) and the MR sensor (26), and a second insulator layer (upper half (101)) positioned between the second shield (28) and the MR sensor (26).

As per claim 9, wherein magnetic fields associated with the magnetic recording disk reside in the shields (D1, D2) to afford a voltage in the MR sensor upon an application of the current via sense current contacts - COL. 7, lines 6-17.

As per claim 11, wherein a width of the shields at a first point (e.g., closest to (51)) on the shields (28, 33) proximate to the magnetic recording disk (at the aforementioned ABS) is less than a second point on the shields distant the magnetic recording disk (e.g., at midpoint of shield lengths, as seen in FIG. 5).

As per claim 12, wherein the first point (e.g., closest to (51)) on the shield defines a trackwidth - FIG. 5.

As per claim 13, wherein at least a portion of the side edges of the shields (28, 33) taper outwardly from the first point to the second point on the shields (28, 33) - FIG. 5.

As per claim 14, wherein the MR sensor is positioned at the second point on the shields (28, 33) - FIG. 5.

As per claim 15, wherein the first and second shields are constructed from a ferromagnetic material (e.g., see COL. 3, lines 58-64).

As per claims 1, 16, 17, 18, 19 and 20, Mizoshita et al. (US 5,583,726) does not expressly disclose wherein the MR (magnetoresistive) sensor is an extraordinary magnetoresistive sensor

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(EMR), in the manner prescribed by claims 1-4, 6-8, 10 and 16-20.

Hines et al. (WO 1/41214 A1) discloses a magnetoresistive sensor (MR) that is adapted to be used in a magnetic recording head sensor of the type disclosed by Mizoshita et al. (US 5,583,726) (e.g., see page 1, second paragraph, page 6, second paragraph, of Hines et al. (WO 1/41214 A1)), wherein the MR sensor is an extraordinary magnetoresistive sensor (EMR) (as per claims 1 and 16-20); wherein the EMR sensor includes a semiconductor material (InSb) with impurities imbedded therein (e.g., see page 3, second paragraph of Hines et al. (WO 1/41214 A1)) (as per claim 2, 16 and 20); wherein the impurities include doping (e.g., see page 3, second paragraph of Hines et al. (WO 1/41214 A1)) (as per claim 3); wherein the impurities include Au (e.g., see page 9, fourth paragraph of Hines et al. (WO 1/41214 A1)) (as per claim 4, 16); wherein a current is applied to a pair of current contacts (53, 54) positioned on the EMR sensor (as per claims 6 and 20); wherein the plane is defined by a flow of the current (from contact (53) to contact (54)) (as per claims 7 and 20); wherein the plane is defined by a sensing field (either electric field or sensed field) associated with the EMR sensor - along a z-axis in FIG. 5) (as per claim 8); wherein a pair of voltage contacts (55, 56) is positioned on the EMR sensor for monitoring the voltage (as per claim 10).

Moreover, as per claim 16, a system is provided, comprising: a magnetic recording disk (e.g., see, *inter alia*, COL. 1, lines 10-17); means for positioning a plane in which the MR sensor is positioned perpendicular to magnetic flux associated with the magnetic recording disk (e.g., see FIG. 5, disk would be positioned vertically, if depicted, in Fig. 5, in a manner known by those of ordinary skill).

Moreover, as per claim 17, a supporting structure (e.g. slider substrate (21)) is coupled to

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the MR sensor (26) for positioning the MR sensor (26) over the magnetic recording disk such that a plane in which the MR sensor (26) is positioned is perpendicular to magnetic flux associated with the magnetic recording disk.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the "extraordinary" magnetoresistive sensor as taught by Hines et al. (WO 1/41214 A1), as the magnetoresistive sensor of Mizoshita et al. (US 5,583,726).

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the "extraordinary" magnetoresistive sensor as taught by Hines et al. (WO 1/41214 A1), as the magnetoresistive sensor of Mizoshita et al. (US 5,583,726), in order to dramatically increase the magnetoresistive sensitivity (i.e., the MR resistance ratio of $\Delta R/R$) of the MR head at room temperatures, as explicitly taught and suggested by Hines et al. (WO 1/41214 A1).

Additionally, as per claim 19, although Mizoshita et al. (US 5,583,726) as applied to Hines et al. (WO 1/41214 A1) does not expressly disclose an actuator for moving the read head across the magnetic recording disk so the read head may access different regions of magnetically recorded data on the magnetic recording disk; and a controller electrically coupled to the read head for detecting changes in resistance of the read head, Official notice is taken that such actuators and controllers for magnetoresistive-type sensors are notoriously old and well known and ubiquitous in the art; such Officially noticed fact being capable of instant and unquestionable demonstration as being well-known.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the sensor of Mizoshita et al. (US 5,583,726), as applied to Hines et al. (WO 1/41214 A1), with a conventional actuator and controller as prescribed in claim 19.

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The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the sensor of Mizoshita et al. (US 5,583,726), as applied to Hines et al. (WO 1/41214 A1), with a conventional actuator and controller as prescribed in claim 19 in order to access multiple recording tracks on a disk and sensing such tracks, as is well known, established and appreciated in the art.

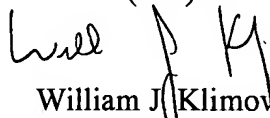
Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William J. Klimowicz whose telephone number is (703) 305-3452. The examiner can normally be reached on Monday-Thursday (6:30AM-5:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T. Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.


William J. Klimowicz
Primary Examiner
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WJK
September 19, 2003